

PROJECT # 590-12-104
REPLACE ELEVATORS #8 #9, BUILDING 110
SECTION 14 26 26
REPAIR AND ALTERATION OF EXISTING ELEVATORS
VA MEDICAL CENTER, HAMTON, VA.

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section of the specification is intended to cover the complete furnishing of all labor, materials, supervision, engineering, and components on elevators located in Building 110. The elevators included in the specification are the existing elevators #8, #9 (Twins) (one group duplex).

1.2 SCOPE OF WORK

A. Elevators shall retain existing machine beams, main and counterweight rails, buffers, counterweights, deflector sheaves, entrance frames, sills, hanger supports, strut angles, fascia plates, slings, governors and tail sheaves, platforms, and cabs.

B. Remove existing machines, controllers, hoist cables, hall lanterns, hall position indicators, hall push buttons, door operators, hoistway doors, door equipment and car operating panels.

1.3 ELEVATOR SERVICE

A. One elevator may be removed from service at any one time, unless prior arrangement is made with Contracting Officer and/or Contracting Officer's Representative (COR) to permit performance of work. All work on elevator vacated shall be completed, put into satisfactory operation, and temporarily accepted before work on any other elevator can start. Prior to each temporary acceptance, contractor shall complete all pertinent safety tests and inspections. Final inspection and tests shall be given only when all work on all elevators has been completed. Final acceptance shall be given only upon successful completion of final inspection and tests. Premises shall be occupied during performance of work, but Contractor shall have uninterrupted use of scheduled elevator vacated for completion of work.

B. When more than one elevator must be removed from service for cross connection of hall pushbuttons or interface of dispatching controls, contractor shall perform this work after 6:00 PM and before 6:30 AM. The Contracting Officer and/or Contracting Officer's Representative shall be notified ten (10) calendar days in advance of this work.

1.4 WORK SCHEDULE

A. Before work is started, submit prepared work schedule for approval and arrange with COR sequence of procedure, means of access to premises, space for storage, use of approaches, corridors, stairways and elevators, location of temporary partitions, etc. The COR must be notified twenty (20) calendar days, in writing, in advance of starting work on elevators. No work may begin on any elevator until all materials for that elevator have been delivered to the site and verified by the Contracting Officer and/or Contracting Officer's Representative. The phasing of work on the elevators shall be coordinated with the Contracting Officer and/or the Contracting Officer's Representative.

1.5 SAFETY PRECAUTIONS

A. Building will be occupied during execution of work. Work shall be conducted in a manner to afford maximum protection of building, facilities, patients, employees and the public and to prevent unreasonable delay or interference with normal functioning of hospital activities.

B. Provide fire extinguishers so that they shall be readily available at all times.

C. It shall be the obligation of the Contractor to maintain a free and clear passageway in each elevator lobby. Parts, tools, etc. shall be kept within the confines of entrance partitions. Trash and debris shall be removed daily.

1.6 REMOVED MATERIALS AND EQUIPMENT

A. Materials that are required to be removed and not specified to be reused or retained under contract shall be removed daily from the site at the expense of the Contractor. Contractor shall receive title to all materials and equipment required to be removed and not specified to be reused or retained, as of date of withdrawal of material from service by Contractor to complete required and scheduled work. Government does not warrant condition of said material to which Contractor shall obtain title, nor shall Government be liable for damage before or after title passes to Contractor.

1.7 APPLICABLE PUBLICATIONS

A. The following specifications and standards of the issues listed below (including the amendments, addenda, and errata designated) form a part of this specification to the extent indicated by the reference thereto. In text, such specifications and standards are referred to by basic number or designation only.

B. Federal Specifications (Fed. Spec.):

- J-C-30B(1).....Cable and Wire: Electrical (Power, Fixed Installation).
- W-C-596A(2).....Connector, Plug, Electrical; Connector, Receptacle, Electrical.
- W-F-406E.....Fittings for Cable, Power, Electrical & Conduit, Metal, Flexible.
- W-F-408E.....Fittings for Conduit, Metal, Rigid, (Thick-Wall & Thin Wall (EMT) Type).
- ABSI/UL 797.....Conduit, Metal, Rigid: Electrical, Thin-wall Steel Type (Electrical Metallic Tubing): Straight Lengths, Elbows & Bends.
- WW-C-566C.....Conduit, Metal, Rigid: and Coupling, Elbow, and Nipple, Electrical Conduit: Zinc-coated.

- 1. GAUGES: Sheet and Plate: U.S. Standard Wire: American wire Gauge (AWG).
- 2. D1.1-72: American Welding Society (AWS).
- 3. IEEE: Institute of Electrical and Electronic Engineers.
- 4. NEMA: National Electric Manufacturers Association.
- 5. NFPA No. 252: Fire Tests of Door Assemblies.

C. The following standards and codes of the issues listed below (including the latest amendments, addenda, and errata) form a part of this specification:

1. A17.1: 2010 American National Standards Institute (ANSI/ASME) Standards: Safety Code for Elevators and Escalators. In text, publication will be referred to as the Code.
2. A17.2: 2010 American National Standards Institute (ANSI) Standards: Practice for the Inspection of Elevators, Escalators and Moving Walks, Inspector's Manual.
3. NFPA No. 70: National Electrical Code, Latest edition. In text, the Code will be referred to as NEC.
4. Uniform Federal Accessibility Standards & VA Supplement to uniform Federal Accessibility Standards, 1988.
5. Americans with Disabilities Act, 1994.

1.8 QUALIFICATIONS:

A. Approval by the Contracting Officer is required of products or services of proposed manufacturer, suppliers and installers and will be contingent upon submission by Contractor of a certificate stating the following:

1. Elevator contractor is currently and regularly engaged in modernization of elevator equipment as one of his principal products.
2. Installer has technical qualifications of at least five years of successful experience, trained supervisory and installation personnel, and facilities to install and/or modernize elevator equipment specified herein.
3. The installers shall be Certified Elevator Mechanics with qualifications of at least five years of successful experience and Apprentices actively pursuing certified mechanic status. Certificates shall be submitted for all workers in this capacity.
4. Proposed Contractor shall submit a list of two or more prior hospital installations where all the elevator equipment he proposes to furnish on this project has performed satisfactorily together under conditions of normal use. The list shall include projects that have been in operation for a period of not less than two years proceeding the date of these specifications; include the names and addresses of the Medical Center and the names of the Medical Center Administrators.

B. Approval of elevator contractor's equipment, maintenance/service will be contingent upon his being able render services within two hours of receipt of notification. Elevator contractor shall submit the names and addresses of his authorized branch or service department which will render service to this installation, together with certification that the quantity and quality of replacement parts stock on hand is sufficient to guarantee continued operation of the elevator installation.

C. Elevator equipment shall operate with maximum noise level no more than 80 decibels. They shall be sufficiently quiet so that they will not create objectionable noises in the car and hoistway, or create a disturbance to occupants on the various floors adjacent to the hoistway and machine room. The COR reserves the right to reject equipment and installations which are, in their opinion, not sufficiently quiet under all operating conditions.

1.9 WIRING DIAGRAMS

A. Provide three complete sets of field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway, as well as the machine room. Install one set framed under plastic on pivoted hard boards and mounted in the elevator machine room as directed by the COR. In the event field modifications are found necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection. Corrected diagrams shall be delivered to the Medical Center COR within 30 days of final acceptance.

B. The following information relating to the specific type of microprocessor controls installed on this project shall be provided:

1. Owner's information manual, containing general data on major components maintenance and adjustment.
2. System logic description.
3. Complete wiring diagrams needed for field troubleshooting, adjustment, repair and/or replacement of components. Diagrams shall be base diagrams, containing all changes and additions made to the equipment during the design and construction period.
4. Changes made during the warranty period shall be noted on the drawings in adequate time to have the finalized drawings reproduced for mounting in the machine room no later than six months prior to the expiration of the warranty period.

1.10 ADDITIONAL EQUIPMENT

A. Additional equipment required to operate specified equipment manufactured and contemplated for this installation shall be furnished and installed. The cost of such equipment shall be included in the base bid.

1.11 SAMPLES AND DESCRIPTIVE DATA

A. Materials shall be submitted singularly and separately and apart from materials specified under other Sections and shall be marked SUBMITTED UNDER SECTION 14 26 26". In accordance with provisions of Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. All submitted drawings and related elevator material shall be forwarded to the VAMC Hampton, 100 Emancipation Drive, Facilities Management Service (138), Hampton, VA. 23667, attention Raymond Fadness in order to perform a concurrent review.

B. Before executing any work, furnish information sufficient to evidence full compliance with contract requirements on proposed items. Such information shall include, as required: Manufacturer's Name, Trade Names, Model or Catalog Number, Nameplate Data (size, capacity, rating) and corresponding specification references (Federal or project specification number and paragraph).

C. Name of manufacturer, type or style designation and applicable data of the following equipment shall be shown on the elevator layouts:

1. Controllers
2. Selector/Leveling unit
3. Solid state motor control (AC DRIVE)
4. Electric door operator; H.P. rating and R.P.M. of motor
5. Auto dial phone system
6. Audio voice system

7. Hoist rope gripper
8. Infrared curtain units
9. Machine room computer system. Motion Control Elevator "mView" system.
10. Top of car run button.
11. Roller Guides.

D. Shop Drawings:

1. Cuts or drawings showing details of all signal and car equipment fixtures. Hall push buttons, hall position indicators
2. Furnish certificates as required under paragraph "Qualifications".
3. Car operating panels.
4. New AC hoist motors and machines.
5. Cab ceiling and lighting.
6. Cab drawings with finishes.
7. Hoistway doors, tracks rollers, door equipment, etc.

1.12 PERFORMANCE STANDARDS

A. The elevators shall be capable of meeting the highest standards of the industry and specifically the following.

B. Contract speed shall mean speed in the UP direction with full capacity load in the car. Speed variation under any load condition, regardless of direction, shall be no more than 5 percent.

C. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per second and the maximum acceleration and retardation shall not exceed 0.2G per second.

D. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration. Stopping shall be without bumps or jars.

E. Full speed running shall be quiet and free from vibration and swaying. When cars are standing at the floor with doors open, they shall remain firmly stopped and shall not rock side to side.

F. Rope stretch recovery shall be provided to re-level cars at a floor, if the ropes slightly stretch.

G. Cars shall not move from side to side during the process of opening and closing the doors.

H. Elevator control systems shall be capable of starting the car without noticeable "roll-back" of hoistway machine sheave, regardless of load condition in car, location of car, or direction of travel.

1.13 TOLERANCES

A. Floor Accuracy:

1. Leveling control systems, 1/8 inch above or below the floor.

1.14 GUARANTEE:

A. The modernized elevator systems shall be guaranteed beginning with the completion and acceptance of the last elevator installation by the COR. It

shall be subject to terms of "GUARANTEE" articles of Section GENERAL CONDITIONS (except for length of guarantee). Upon receipt of notice from the Government of failure of any portion of materials and workmanship furnished, affected part or parts shall be replaced promptly with new parts by and at the expense of the contractor. The guarantee period shall concur with the length of the maintenance contract.

B. No device will be acceptable that will not give perfect satisfaction without excessive maintenance and attention. If it becomes evident during the guarantee period that the device is not functioning properly or in accordance with specification requirements, or if in the opinion of the COR, excessive maintenance and attention must be employed to keep device operating, device shall be installed as part of work until satisfactory operation of installation is obtained. Period of guarantee shall start anew from date of completion of new installation performed in accordance with foregoing requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Where stainless steel is specified, it shall be corrosion resisting steel complying with Fed. Spec. QQ-S-766, Class 302 or 304, Condition A with Number 4 finish (150 grit) on exposed surfaces. Stainless steel shall have the grain of belting in the direction of the longest dimension and all surfaces shall be perfectly smooth and without waves. During erection, all stainless steel surfaces shall be protected by suitable material.

2.2 MANUFACTURED PRODUCTS

A. Materials, devices and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. Items not meeting this requirement, but which otherwise meet technical specifications and the merits of which can be established through reliable test reports or physical examination of representative samples, will be considered.

B. When two or more units of same class of materials, devices or equipment are required, these units shall be products of one manufacturer.

C. Manufactures of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit.

1. All components of an assembled unit shall be products of the same manufacturer.

2. Parts that are alike shall be the product of a single manufacturer.

3. Components shall be compatible with each other and with the total assembly for the intended service.

D. If the elevator equipment to be installed is not known to the COR, the Elevator Contractor shall submit drawings in triplicate (2 prints and 1 sepia), for approval, showing all details or demonstrate to the satisfaction of the COR that the equipment to be installed is in strict accordance to the Specifications.

E. Welding at the project site shall be made by welders and welding operators who have previously qualified by test as prescribed in American Welding Society Publications AWS D1.1 to perform type of work required. VAMC shall require welding certificates be submitted for all workers employed in this capacity. A burning permit is required before any burning or welding is done. COR to issue permit.

F. Motor nameplates shall state rated horsepower, speed, volts, amperes and other characteristics required by NEMA Standards and shall be securely attached to the item of equipment in a conspicuous location.

G. The elevator equipment, including controllers, selectors, door operators, relay panels, leveling units, and supervisory system, shall be the product of one manufacturer of established reputation, except that any of the above items may be the products, either wholly or in part, of any manufacturer of established reputation provided such items are capably engineered and produced under coordinated specifications to ensure a first class, safe and smooth operating system.

H. Provide all new keys. New keys to match existing Medco keys for elevators in Building 110. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish 4 keys for each individual switch or lock. Do not provide "barrel" type keys. Attach each key to a tag bearing a stamped or etched legend identifying its purpose. Engrave tags and imprint "Property of U.S. Government" Provide standard fire service keys and switches to match existing. Provide 4 keys per fire switch. Engrave tags and imprint "Property of U.S. Government" on reverse side.

2.3 CAPACITY, SPEED, TRAVEL, ETC.

A. Each elevator shall have the capacity to lift a live load (exclusive of the weight of the car and ropes) at the speed in feet per minute as specified in the following schedule:

Elev. No	Rated Load Lbs.	Speed FPM	Rated Travel Ft.	Total Floors Served	Stops	No. of Openings
# 8	3500	250	75ft. 5in. B;	1-6	7	7
# 9	3500	250	75ft. 5in. B;	1-6	7	7

B. Total travel is approximate and must be verified in the field by the Contractor.

C. Rated speed shall mean speed in either direction of travel with rated capacity load in car. Actual speed, under any load condition shall not vary more than five percent of rated speed.

2.4 POWER SUPPLY

A. Power for emergency operation of elevators specified will be available from emergency power feeders and transfer switch.

B. Reuse existing shunt trip breakers located in elevator machine room.

C. See Section 2.11 for Auxiliary power operation.

2.5 GROUNDING

A. Equipment grounding shall be provided. Ground conductors, supports, controller enclosure, motors, platform and car frames and other noncurrent conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, insulated and sized as required by NEC. Bond the grounding wires to each pull boxes, junction boxes, cabinets and other enclosures through which the wires pass.

2.6 CONDUIT, WIREWAY (DUCT):

A. May reuse existing conduit and hoistway/machine room duct that conforms to NEC. New conduit shall comply with the following paragraphs.

B. Unless otherwise specified or approved, install electrical conductors, except traveling cable connections to the car, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Where permitted by NEC, 1/2-inch trade size conduits and EMT may be used only for tap connections to interlocks, emergency exits and leveling units. All raceways completely embedded in concrete slabs, walls, or floor fill shall be rigid steel conduit. No rigid conduit or electrical metallic tubing shall be smaller than 3/4-inch electrical trade size. An auxiliary gutter may be used between controller, starter, and similar apparatus in the elevator machine room. Fully protect self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC. Flexible heavy-duty service cord, type S.O., may be used between fixed car wiring and switches on car doors for infrared curtain units.

C. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushing. Install a steel lock nut under the bushing if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.

D. Conduit and EMT fittings and connectors using set screws or indentations as a means of attachment shall not be used.

E. Connect motors or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits. Certain existing conduits and ducts may be reused if they are code conforming and prior agreement is received from the COR.

2.7 CONDUCTORS: EXISTING TO BE REMOVED

A. Unless otherwise specified, conductors, exclusive of traveling cables, shall be stranded or solid coated annealed copper in accordance with Fed. Spec. J-C-30 for either type RHW or THW. Where 16 and 18 AWG are permitted by NEC, either single conductor cable in accordance with Fed. Spec. J-C-580 for type TF or multiconductor cable may be used, provided the insulation of single conductor cable may be, and outer jacket of multiconductor cable is, flame retardant and moisture resistant. Multiconductor cable shall have color coding or other suitable identification for each conductor. Conductors for control board wiring, including wiring between main circuit resistors and control boards, shall be in accordance with NEC. No joints or splices will be permitted in wiring, except as outlets. Tap connectors may be used in wireways, provided they meet all UL requirements.

B. All wiring must test free from short circuits or grounds. Insulation resistance between individual external conductors and between conductors and ground, shall be not less than one megohm.

C. Where size of conductors is not given, capacity shall be such that maximum current shall not exceed limits prescribed by NEC.

D. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors. The contractor may at his option make these terminal connections on

No. 10 or smaller conductors with approved terminal eyelets set on the conductor with a special setting tool or with an approved pressure type terminal block. Terminal blocks using pierce-through serrated washers are not acceptable.

2.8 TRAVELING CABLES: EXISTING TO BE REMOVED

A. All conductors to the car shall consist of flexible traveling cables conforming with the requirements of NEC. Traveling cables shall run from the junction box on top of the car directly to controller. Remove existing top of hoistway junction box. Junction boxes on car shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486A requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying number for each connection. Cable shall be securely anchored to avoid strain on individual terminal connections. Outer covering must remain intact between junction boxes. Abrupt bending, twisting and/or distortion of the cables shall not be permitted.

B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than four spare conductors in each traveling cable.

C. Provide shielded coaxial conductors for the auto dial system within the traveling cable. Add 5 pair shielded wires for possible future card reader, 2RG/6U coaxial CCTV cables and 2 pair 14 gauge wire for CCTV power as needed.

D. If, due to sway or change in relative position of traveling cables, complete freedom from contact with the hoistway or elevator construction cannot be obtained, shields, pads, or hardware cloth shall be provided on the elevator or hoistway structure wherever necessary to prevent damage to the traveling cables.

E. Car lighting circuits shall be connected to the auxiliary/emergency power panel.

2.9 CONTROLLERS, STARTERS, RELAY PANELS, SUPERVISORY PANELS, SELECTORS AND GENERATORS: EXISTING TO BE REMOVED

A. All controllers required for the control, dispatching, signals and door operations of the system shall be in accordance with the requirements of this paragraph.

B. All controller assemblies shall provide efficient, smooth and practically stepless acceleration and deceleration of the elevator hoisting machine, automatically and independently of the load in the car. The panel material shall be self-extinguishing, having a flame resistance that meet the requirements of either flammability test method 2021 or 2023, or Federal Test Method Standard No. 406.

C. All switches, relays and other components shall be mounted on the front of controller, starter, relay and selector panels. All wiring connections for controller components, resistors in excess of 30-watt capacity and transformers shall be mounted within enclosure. All controller wiring shall be neatly formed, laced and securely fastened in place.

D. If swing panel construction is used for any controller components, details shall be submitted for approval.

E. Wiring of the various external control and operating circuits shall be brought to a terminal board in the controller from where it shall continue to the various switches, solenoids and other devices on the panel. Connections of wires to terminals from external circuits shall be made with metal eyelets, solderless lugs or similar connectors. Starting and accelerating resistance

shall be constructed of resistance wire or cast iron grids insulated with mica or other approved material and mounted to give constant pressure at all temperatures. If wire resistance is used, the material shall be capable of withstanding frequent heating and cooling cycles without excessive oxidation or crystallization and shall not be affected by atmospheric conditions. Resistance in connections with solenoids, etc., shall be wire, wound on noncombustible forms of insulating material and mounted so as to be readily renewable.

F. Equipment shall be provided to protect the driving motor against overload and single phasing in all three (3) phases of the delta connection, protect the control equipment against overload and phase reversal.

G. Where time delay relays are used in the circuits, they shall be of an acceptable design that is reliable and consistent, such as condenser timing or electronic timing circuits. No dash pot time relays shall be used.

H. Each device on all panels shall be properly identified by name, letter or standard symbol which shall be neatly stencil painted (or otherwise marked), in an indelible and legible manner, on device or panel. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors to controllers, selectors and relay panels shall be neatly formed, laced and identified.

I. Safety switch shall cut off current automatically apply brake and stop car upon current failure and/or upon operation of any electrical safety device.

2.10 MICROPROCESSOR CONTROL SYSTEM; VVVF AC.

A. Provide Motion Control Elevator (MCE) Model 4000 AC type controller. Provide solid state components and printed circuit boards to control the hoisting machine and signal functions in accordance with these specifications. Complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval. All controllers shall be non-proprietary and no special tool, including a hand held testing tool shall be necessary for adjustments or maintenance. The controller vendor shall be able to provide immediate tech support and be able to overnight mail any parts necessary for maintenance.

B. All controller assemblies shall provide efficient, smooth, stepless acceleration and deceleration of the elevator hoisting machine, automatically and irrespective of the load in the car. All control equipment shall be enclosed in a metal cabinet with lockable, hinged door(s) and shall be provided with a means of ventilation. All non-conducting metal parts in the machine room shall be grounded in accordance with NEC. Cabinet shall be securely attached to the building structure.

C. Modules for the control of each elevator system, including dispatching, signals, door operation and special operation, shall be installed in a NEMA, Type 1, General Purpose Enclosure. Circuit boards shall be moisture-resistant, be non-corrosive, be nonconductive, be fabricated of noncombustible material and be of adequate thickness to support the components mounted thereon.

D. Each device, module and fuse (with ampere rating) shall be identified by name, letter or standard symbol in an approved indelible and legible manner on the device or panel. Coordinate identification markings with identical markings on wiring diagrams.

E. The electrical connections between the printed circuit boards (modules) and the circuit connectors incorporated in the mounting racks shall be made through individual tabs which shall be an integral part of each module. The tabs shall

be nickel-gold plated (or other approved metal or equal electrical characteristics). Modules shall be keyed or notched so as to prevent insertion of the modules in the inverted position.

F. Light emitting diodes (LEDS) shall be for visual monitoring of individual modules.

G. Components shall have interlocking circuits to assure fail-safe operation and to prevent unwarranted elevator movement should any component fail to function properly.

H. Method of wire wrapping for point to point with connections on the mounting racks shall be submitted for approval.

I. Modules shall be of the type that plug into pre-wired mounting racks. Field wiring or alteration shall not be necessary in order to replace defective modules.

J. Field wiring changes required during construction shall be made only to the mounting rack connection points and not to the individual module circuitry or components. If it becomes necessary to alter individual modules, they shall be returned to the factory where such design changes shall be made and module design records changes so that correct replacement units shall be available.

K. Module boards shall be fabricated from nonconductive, non-corrosive material and shall be of sufficient strength so as to support all components mounted thereon without warping. Mounting racks shall be spaced sufficiently apart to prevent accidental contact between individual modules.

L. All logic symbols and circuitry designations shall be in accordance with ASME Standards.

M. Solid state components shall be designed to operate within a temperature range of 30 degrees F to 104 degrees F. No temperature controller or air-conditioned rooms shall be required for proper operation of solid state components.

N. Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce through serrated washers shall not be acceptable.

2.11 AUXILIARY POWER OPERATION; EXISTING

A. The control system for all elevators in this contract shall include provisions for operation on auxiliary power upon failure of the normal power supply.

B. Auxiliary power supply, including its starting means and a transfer switch for transfer of power supply from normal to auxiliary, are existing.

C. Upon loss of normal power supply there shall be a delay before transferring to auxiliary power of 10 seconds minimum to 45 seconds maximum, the delay shall be accomplished through an adjustable timing device. Following this adjustable delay the associated elevators shall function as follows:

1. Selector switch, Automatic position:

- a. Not more than one elevator at a time in duplex shall be automatically selected and returned to the main floor, at normal speed, cycle its car and hoistway doors and shut down, with "Door Open" button remaining operable.

- b. As each elevator reaches the designated floor and shuts down, another elevator shall start and return to the designated floor.
 - c. Elevators that have been manually removed from automatic service and are on independent service, fire service or medical emergency shall receive an automatic return signal. Elevators on inspection service or out of service shall not receive a signal.
 - d. When an elevator is given a signal to return and it is unable to start its movement to the designated floor within 30 seconds it shall be by-passed. When an elevator is by-passed, another elevator shall start and return.
 - e. This process shall continue until all elevators have returned to the designated floor and shut down.
 - f. Any elevator or elevators by-passed on initial return signal shall be signaled again.
 - g. When all cars in group have returned to designated floor, last elevator down to main floor shall be designated for automatic operation. Individual cars in each group shall restart at 5 second intervals.
 - h. If electric traction elevators are keyed on to medical emergency service in the car prior to transfer to auxiliary power operation, medical emergency service shall be retained. A car call registered prior to transfer shall also be retained. This elevator shall be the first automatically selected elevator to operate on auxiliary power operation and complete its selected call demand. The elevator will return to the designated floor after the key switch is reset to normal position.
2. Selector switch, Manual operation:
- a. Selector switch shall be mechanically and electrically interlocked to prevent the selection of more than one elevator from operating on auxiliary power.
 - b. The selector switch shall have positions marked with the number of each elevator controlled. It shall also have a position marked "Automatic". When the selector switch is set to the automatic position, the medical emergency service car shall operate on auxiliary power operation, or if none, the last car arriving at the designated floor shall operate on auxiliary power operation.
 - c. Change in selection of elevators shall be by means of the selection switch and shall occur only when the previous selected elevator is stopped at the designated floor.
 - d. The selector switch shall be locked out of operation when the system is in the normal mode of operation.
 - e. Locate the selector switch above the hall push button station at the designated level in a NEMA 1B flush type enclosure furnished with a brushed finish stainless steel hinged door and frame. The door shall contain a tumbler type lock furnished with four keys. The enclosure faceplate shall be identified "Auxiliary Power Control" with 13 mm (1/2 in.) engraved letters filled with black paint.
3. The inside of the selector panel shall be brushed finish stainless steel with each device identified with 3 mm (1/8 in.) engraving filled with black paint. The panel shall contain:

- a. Selector switch for selecting the elevators shall be toggle or rotary type switch.
- b. Pilot lights to indicate normal mode of operation, auxiliary power service available, and which elevator or elevators in each group is connected to auxiliary service.
- c. A lamp test circuit consisting of a momentary contact push button to test all pilot lights in the circuit.
- d. Provide a permanently mounted, easy to read, instruction plate which shall include operating instructions for auxiliary power service and instructions for lamp test circuits.

D. Prior to the return of normal power an adjustable timed circuit shall be activated that will cause all cars to remain at a floor if already there or stop and remain at the next floor if in flight. Actual transfer of power from auxiliary power to normal building power shall take place after all cars are stopped at a floor with their doors open.

E. Car lighting circuits shall be connected to the auxiliary power panel.

2.12 VARIABLE VOLTAGE VARIABLE FREQUENCY; VVVF

A. Solid State Motor Control:

1. Elevator control shall be affected by means of a compact solid state motor control unit for each elevator with electrical characteristics to suit the power supply. The system shall consist of the necessary three phase, full-wave bridge rectifiers and be fully regenerative.

2. Solid state motor control unit shall operate with high efficiency and low power consumption, have sufficient capacity to handle peak currents typical of elevator service and contain a balanced, coordinated fault protection system which shall accomplish not less than the following:

- a. Protect the complete power circuit and specifically the power semi-conductors from failure under short circuit (bolted fault) conditions.
- b. Protect against limited faults arising from partial grounds, partial shorts in the motor armature or in the power unit itself.
- c. Protect the drive motor against sustained overloads. A solid state overload circuit shall be used.
- d. Protect motor and power unit against instantaneous peak overload.
- e. Provide semi-conductor transient protection.
- f. Provide phase sequence protection to insure incoming line is phased properly.
- g. Provide regenerative drive.
- h. Removable printed circuit cards shall be provided for the AC control, designed so the tabs cannot be reversed.

2.13 GEARED TRACTION AC HOIST MACHINES; NEW

A. Geared traction machines to meet ASME A17.1 Elevator Code.

B. The geared traction machine shall be of the single worm and gear, single wrap traction type, with motor, brake, worm gear housing, and sheave pedestals mounted in rigid bedplate.

C. Hoisting motor of geared traction machine shall be alternative current type and shall be designed to develop the required high starting torque with a low starting current and shall conform to the NEMA Standards for 50 degree C, sixty minute rated elevator hoisting motor.

D. Vibration isolating machine foundation and pads shall be furnished for machines mounted over hoistway.

E. Install new motor wires from controller to machine motor.

2.14 SHEAVES

A. Reuse existing deflector sheaves.

B. Reuse existing guards on deflector and machine sheaves.

2.15 MACHINE BEAMS - RETAIN EXISTING

2.16 CAR AND COUNTERWEIGHT GUIDE RAILS

A. Retain existing car and counterweight guide rails and brackets.

B. Thoroughly clean all guide rails of grease, oil, rust and other foreign substances. File and remove all rough edges and surfaces and tighten bracket bolts and guide clips for smooth and quiet operation of car and counterweight.

C. Provide any required rail backing and/or intermediate tie brackets to comply with ASME Code for bracket spacing for both car and counterweight rails.

2.17 ROLLER GUIDES FOR CAR AND COUNTERWEIGHT;

A. Provide car and counterweight with new roller guides.

B. Each guide shall be the approved type consisting of not less than 6 wheels for car and 3 wheels for counterweights, each with durable, oil resistant material with tires rotating on ball bearings sealed in lubrication. Assemble rollers on a substantial metal base and mount to provide continuous spring pressure contact of all wheels with the corresponding rail surface under all conditions of loading and operation. The wheels shall be of ample diameter and shall run on three machined finished dry rail surfaces. Secure the roller guides on each side of the car and counterweight frame. All mounted bolts shall be fitted with nuts, flat washers, split lock washers and if required, beveled washers.

C. Provide sheet metal guards to protect wheels on top of car and counterweight.

2.18 CAR AND COUNTERWEIGHT BUFFERS: REUSE EXISTING

A. Reuse existing buffers and buffer switches. Rewire existing pit switches. Check oil level. Reuse existing counterweight guards. Clean and paint.

2.19 COUNTERWEIGHTS: EXISTING TO BE RETAINED.

A. The counterweights shall be cleaned and all missing or damaged bolts, tie rods, frames and members shall be replaced.

B. Subweights shall be added to or removed from the counterweights frame to provide a counterbalance equal to the weight of the complete car and approximately 40 percent of the rated capacity. New subweight shall be sectional cast iron, flame cut hot rolled steel or cast lead.

C. Reuse existing counterweight guards.

2.20 HOISTING ROPES; REPLACE EXISTING.

A. Replace existing hoisting ropes on all elevators.

1. Ropes to meet ASME A17.1 Code

2. Contractor to use wedge type shackles.

2.21 GOVERNOR ROPE: NEW

A. Governor Rope shall be 6 x 19 or 8 x 19 wire rope, preformed traction steel, uncoated, fiber core, conforming to Federal Specification RR-W-410 with minimum nominal diameter of 0.375 inch having a minimum safety factor of 5. Tiller rope construction is not acceptable.

B. Under normal operation rope shall run free and clear of governor jaws, rope guards, and other stationary parts.

C. Securely attach governor rope tag to governor rope releasing carrier. Data tag shall be corrosion-resisting metal and bear data as required by ASME A17.1 Section 2.18.

2.22 OVERSPEED GOVERNOR: REUSE EXISTING

A. Reuse existing governors. Reuse existing governor switches speed and speed reducing switches to operate as required by ASME A17.1 Code. Switches shall operate in both directions.

B. The governor rope clamping device shall be adjusted so that no appreciable damage to or deformation of the governor rope shall result from the stopping action of the device in operating the safety. The grip jaws shall be of such shape and length that pull-through action of the governor rope, as required by Code, will result in a minimum amount of rope abrasion.

C. No field painting of governor parts shall be permitted.

2.23 ASCENDING CAR OVERSPEED DEVICE:

A. Provide hoist rope gripper device as per ASME A17.1 Elevator Code to stop elevator in up direction when elevator is speeding in the up direction.

2.24 NORMAL AND FINAL TERMINAL STOPPING DEVICES: NEW

A. Normal and final terminal stopping devices shall conform with the Code.

B. The normal stopping switch on car or in hoistway shall slow speed of car and bring it to an automatic stop level with the terminal landings.

1. Switch shall function with any load up to and including 125 percent of rated elevator capacity at any speed obtained in normal operation.

2. Switch, when opened, shall permit operation of car in reverse direction.

3. No normal stopping device, other than one mounted on car and activated by cams in hoistway, or mounted in hoistway and activated by cams on car, shall be permitted.

C. Final terminal stopping switches in the hoistway.

1. Switches shall be positively opened by car should the car travel beyond the normal stopping switches.

2. Switches, when opened, shall remove power from hoist motor, apply hoist machine brake and prevent operation of car in either direction.

2.25 WORKMAN'S LIGHTS AND OUTLETS: NEW

A. Provide lamps with wire guards on top of each elevator car. Reuse existing lamps beneath the platform.

2.26 TOP-OF-THE CAR OPERATING DEVICE: NEW

A. The device shall conform to ASME A17.1.

B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked "INSPECTION" and "NORMAL" on the faceplate, with 1/4-inch letters.

C. Movement of the elevator shall be accomplished by the continuous pressure on a direction button and a safety button.

D. Provide emergency stop toggle type switch as specified in ASME A17.1.

E. Provide permanent identification for the operation of all components in the device.

F. The device shall be permanently attached to the elevator crosshead on the side of the elevator which is nearest to the hoistway doors.

2.27 CAR LEVELING DEVICE: EXISTING TO BE REMOVED

A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 1/8 inch of exact level with landing for which a stop is initiated regardless of load in car or direction of travel.

B. Car shall, at all times, level into the floor and shall not stop above or below the floor and level back.

C. The automatic leveling device shall, within its zone, be entirely independent of the operating device and if the car stops short or travels beyond the floor, the leveling device shall automatically correct this condition and maintain the car within plus or minus 1/8 inch of level with the floor landing regardless of the load carried and its stretching effect on the cables during loading and unloading.

D. A car leveling device functioning through the medium of vacuum tubes or photoelectric tubes or optic type is not acceptable. Approved permanent magnet, electromagnetic, encoder, or selector type leveling is required.

2.28 EMERGENCY STOP SWITCHES:

A. Emergency stop switches shall conform to the Code.

B. Each stop switch shall be red in color and shall have its "identity" and STOP' and "RUN" positions legibly and indelibly identified.

C. Provide new pit switches. Locate one pit switch 4 feet above pit floor and a second pit switch located on wall 4 feet above lowest landing floor by pit ladder.

2.29 OPERATING DEVICE FACEPLATES: NEW

A. Fabricate faceplates for all elevator operating and signal devices from not less than 1/8-inch thick flat stainless steel. Install all faceplates flush with surface upon which they are mounted.

B. New corridor pushbutton faceplates shall be the same size or larger as existing faceplates.

C. Fasten all car and corridor operating device and signal device faceplates with non-corrosive white metal spanner head or bristol head tamperproof screws.

D. Design car and corridor push-button faceplates so that pressure on pushbuttons shall be independent of pressure on pushbutton contacts.

E. Engraved legends in faceplates shall have lettering 1/4-inch high filled with black paint.

F. Provide braille on pushbutton faceplates.

G. Provide engraved fire flame symbol and message on push button face.

2.30 OPERATING DEVICES AT HOISTWAY LANDINGS: EXISTING TO BE REMOVED

A. Provide new landing call buttons at all floors. May reuse existing push button boxes if centerline of new plates is 42 inches on elevators.

B. Fixtures for intermediate landings shall contain "UP" and "DOWN" buttons. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button. **Vandal proof type push buttons are not acceptable.**

C. The direction of each button shall be legibly and indelibly identified by arrows not less than 1/2 inch high in the face of each button.

D. Each button shall contain an integral registration light which shall illuminate upon registration of a call and shall extinguish when the call is answered. Install LED type light bulbs, white in color, in hall push buttons.

E. If a landing button is operated while the car and hoistway doors are closing at that floor, the call shall be registered for the next elevator. Calls so registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button, or infrared curtain unit.

2.31 ELEVATOR CAR OPERATING PANELS: EXISTING TO BE REMOVED

A. New main car operating panels shall be located in the front wall panel of the car enclosure. It shall be positioned such that top passenger use device floor button shall be 4 feet above the finished floor.

B. All terminology on main car operating panel and auxiliary panel shall be raised or engraved. Use 1/8-inch letters to identify all other devices in upper section of the main car operating panel. The handicapped marking contrasting background shall be recessed .030 inch in a square or rectangular shape, in the faceplate, with the finished face of the 1/2 inch high numeral and Braille markings flush with the finished faceplate. The numerals and markings shall be integrated with the faceplates. Applied plates are unacceptable. Engrave number of elevator, one inch high, in upper part of car panel.

C. Two-section flush panel shall have lower section recessed and fitted with hinged doors. Door of lower section shall have concealed hinges and shall be in same front plane as lower section and shall be fitted with cylinder type, key operated lock. Two-section panel shall have one piece faceplate.

D. The upper section shall contain:

1. Engrave elevator number, 1 in. high with black paint for contrast.

2. Engrave capacity plate information with black paint for contrast with freight loading class and number of passengers allowed.

3. Emergency car lighting system consisting of a rechargeable battery, charger, controls, and LED illuminated light fixture. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall be capable of maintaining a minimum illumination of 1.0 foot-candle when measured 48 in. above the car floor and approximately 12 in. in front of the car operating panel, for not less than four (4) hours.

4. LED illuminated digital car position indicator with direction arrows. Digital display floor numbers and direction arrows shall be a minimum of 2 in. high.

5. Firefighters' Emergency Operation Panel shall conform to the requirements of ASME A17.1 Section 2.27. Firefighters' Panel shall be 66 in. minimum to 72 in. maximum to the top of the panel above finished floor.

6. Firefighters' Emergency Indicator Light shall be round with a minimum diameter of 1 in.
 7. Medical Emergency switch marked "MEDICAL EMERGENCY" with two positions labeled "ON" and "OFF" and Medical Emergency Indicator Light located next to the key switch shall be round with a minimum diameter of 25 mm (1 in.). Instruction for Medical Emergency operation shall be engraved below the key switch and light.
 8. Key operated Independent Service; see Section 2.34 for detailed description.
 9. Complete set of round car call push buttons, minimum diameter of 1 in., and LED white light illuminated, corresponding to the floors served. Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 1/2 in. high in the face of the call button. **Vandal proof buttons are not acceptable.**
 10. Door Open and Door Close buttons shall be located below the car call buttons. They shall have "OPEN" and "CLOSE" legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door jamb as required by ADA.
 11. Red Emergency Alarm button that shall be located below the car operating buttons. Mount the emergency alarm button not lower than 35 in. above the finished floor. It shall be connected to audible signaling devices as required by A17.1 Rule 2.27.1.2. Provide audible signaling devices including the necessary wiring.
 12. Emergency Help push button shall activate two way communications by the auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 1/2 in. high letters. Engrave "Push To Talk" under button ¼ inch high letters.
 13. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 1/2 in. numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.
- E. The service operation panel, in the lower section shall contain the following items
1. A toggle light switch labeled "LIGHTS" for controlling interior car lighting with its two positions marked "ON" and "OFF".
 2. Inspection (toggle) switch that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled "INSPECTION" with its two positions marked "ON" and "OFF".
 3. Three position toggle switch labeled "FAN" with its positions marked "HIGH", "LOW" and "OFF" for controlling car ventilating blower.
 4. Two position, spring return, toggle switch or push button to test the emergency light and alarm device. It shall be labeled "TEST EMERGENCY LIGHT AND ALARM".
 5. Two position emergency stop switch, when operated, shall interrupt power supply and stop the elevator independently of regular operating devices. Emergency stop switch shall be marked "PULL TO STOP" and "PUSH TO RUN".

2.32 AUXILIARY CAR OPERATING PANEL;

A. Provide an auxiliary car operating panel in side wall of the elevator between the handrails immediately adjacent to the front entrance column strike jamb. The auxiliary car operating panel shall contain only those controls essential to passenger (public) operation. The auxiliary car operating panel faceplate shall match the main car operating panel faceplate in material and general design. Secure the faceplate with stainless steel tamperproof screws.

1. Mount door "OPEN" and door "CLOSE" buttons closest to the door jamb and mount the alarm button no lower than 35 in. above the finished floor. The Door Open button shall be located closest to the door as required by ADA.
2. Complete set of round car call push buttons, minimum diameter 1 in and LED white light illuminated, corresponding to the floors served. Car call button shall be legibly and indelibly identified by a floor number and/or letter not less than 1/2 in. high in the face of the call button corresponding to the numbers of the main car operating buttons. Install buttons horizontally for side mounted panel.
3. Cross-connect all buttons in the auxiliary car operating panels to their corresponding buttons in the main car operating panel. Registration of a car call shall cause the corresponding button to illuminate in the main and auxiliary car operating panel.
4. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 1/2 in. high letters. Install emergency telephone system in the auxiliary car operating panel. Engrave "Push To Talk" under phone button in ¼ inch high letters.
5. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 1/2 in. numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.
6. Submit design of auxiliary car operating panel for approval.

2.33 DUPLEX SELECTIVE COLLECTIVE AUTOMATIC OPERATION

- A. Provide duplex selective collective automatic operation for Elevators #8, #9 (one group).
- B. Design system so that on operation of one or more dispatch buttons within the car, car shall start automatically, providing hoistway door interlock and car door contact circuits have been established and shall stop at the first floor reached for which a call has been registered. Stops shall be made in the natural order in which floors have been reached, irrespective of sequence in which calls have been registered, provided call is registered sufficiently in advance of arrival of car at that particular floor to permit stop to be made. During this operation the cars shall only respond to calls registered at the landings, but only one car shall respond to any one landing call and it shall be the car nearest to the call which is set to travel in the corresponding direction of the registered call.
- C. Arrange the system so that normally one car shall be parked at the basement floor landing and the other car at the third floor landing. Both cars shall park with their doors closed. The car parked at the main landing shall be considered

the "parked" car and the other car shall be considered the "free" car. Should both cars complete their calls at the main landing, the car which arrived first shall be considered the "free" car. An idle "free" car shall respond to any landing call registered either above or below the floor at which it is standing. When the "free" car is responding to car or landing calls, the "parked" car shall automatically start up in response to an "up" call registered below an "up" traveling "free" car, or "up" or "down" call registered above a "down" traveling "free" car. Either car shall always respond to its own calls. If the "parked" car leaves the main landing for any reason, it shall assume the duties of the "free" car and the "free" car shall proceed upon completion of its calls, to the main landing to become the "parked" car.

D. If a car is taken out of service for any reason, or fails to respond to a landing call within a predetermined adjustable time limit of approximately 40 to 180 seconds, all calls shall be transferred to the other car which shall function as a single car selective collective elevator until the "out of service" car is returned to the system.

E. Provide a time relay which shall hold the car and the hoistway doors open for an adjustable predetermined time to give passengers time to leave or enter the car.

F. A landing car call registered from the landing at which either the "parked" car or "free" car is parked shall automatically open car and hoistway doors. Provide sufficient time delay to allow entering passengers to register a car call and establish direction before that car can respond to other landing calls registered at the same time.

G. If the system has landing calls in registration continuously without interruption for an adjustable predetermined period of 30 to 90 seconds, the "parked" car shall automatically start up to assist the "free" car in answering calls.

2.34 INDEPENDENT SERVICE

A. A two-position key operated "INDEPENDENT SERVICE" switch shall be provided in the main car operating panel which shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch and shall bypass all calls registered on landing push buttons. Car and hoistway doors shall not close until a car button or the "DOOR CLOSE" button is pressed and held until interlock circuits are made up. When switch is returned to "OFF" position, normal service shall be resumed. In addition, the elevator shall be disconnected from the automatic dispatching system and the hall position indicators and the highest call reversal shall not be effective. The other car shall respond to all hall calls.

2.35 MEDICAL EMERGENCY SERVICE

A. Provisions shall be made for calling elevators #8, #9 on "Medical Emergency" operating independently from the dispatch signals and landing call signals. Provide a two-position, key-operated, momentary contact, spring return switch at each floor.

B. Install key switch in the floor landing push button fixture above the push buttons.

C. Landing key switches shall be momentary pressure-spring return to "OFF" position. Provide a call registered light indicator adjacent to key switch. The landing key switch and the "Medical Emergency" key switch in the car shall not be operable by keys used for any other purpose in the hospital.

D. When switch is activated at any floor, the call register light indicator shall illuminate at that floor only, and the elevator supervisory control system shall instantly select the nearest available elevator in service to respond to the medical emergency call. Immediately upon selection, all car calls within that car shall be cancelled. Transfer any landing calls which had previously been assigned that car to another car. If the selected car is traveling away from the medical emergency call, it shall slow down and stop at the nearest floor, maintain closed doors, reverse direction and proceed nonstop to the medical emergency call floor. If the selected car is traveling toward the medical emergency call floor, it shall proceed to that floor nonstop. If at the time of selection it is slowing down for a stop, the car shall stop, maintain doors closed, and start immediately toward the medical emergency floor.

E. Arriving at the medical emergency floor, the car shall remain with doors open for 30 seconds. After this interval has expired and the car has not been placed on medical emergency operation from within the car, the car shall automatically return to normal service.

F. Locate a "Medical Emergency" key switch in the upper section of each main car operating panel for selecting medical emergency service. Activation of the key switch will allow the car to accept a car call for any floor, close doors, and proceed nonstop to the floor desired. The return of the key switch to normal position will restore the car to normal service. The key shall be removable only in the off position.

G. Any car in the duplex may be selected. Additional medical emergency calls, as they are registered in the system, shall cause the second car to respond as described below, always on the basis of one medical emergency call per car.

H. Provide an LED illuminated indicator light next to the Medical Emergency key switch the same size as the Fire Service indicator. In the center of the rear cab panel provide a back lighted "MEDICAL EMERGENCY" LED illuminated display that shall flash on and off continuously when the car is assigned to this operation and until it is restored to normal service. "MEDICAL EMERGENCY" indicator shall be a photographic negative type 72 in. to center above the floor, 6 in. wide X 3 in. high, with 1/2 in. high letters and legible only when illuminated.

I. All of the key switches in the "Medical Emergency" system for each and every elevator shall operate from the same key. The medical emergency call service key shall not operate any other key switch in the elevator system, nor shall any other key required by the elevator system be able to operate the medical emergency call service switches.

J. Should all the cars be operating on "Independent Service", the medical emergency service indicator lights in the car operating panel and rear wall shall be illuminated, buzzer shall sound, and the "Audio Voice" system shall direct the attendant to return the car to automatic operation.

1. Engrave an instruction plate on the main car operating panel for the attendant to follow when the service is activated.

K. Should all the cars be out of service and unable to answer medical emergency calls, the call register light shall not illuminate.

L. Each switch faceplate shall have legible indelible legends engraved or etched to indicate its identity and positions. All letters in faceplates shall be 6 mm (1/4 in.) high, filled with black paint.

M. When Phase I fire recall is activated it shall over-ride elevators on medical emergency service and return them to the main or alternate fire service recall

floor. When the fire emergency floor has been identified the attendants may complete their medical emergency run on Phase II firefighters' operation if life safety is not affected.

N. Provide four (4) keys for each "Medical Emergency" key cylinder furnished.

2.36 FIRE SERVICE: REUSE EXISTING

A. Provide fire service as per the ASME A17.1 Code.

B. Reuse smoke detector devices that are designated for actuation of Elevator Phase 1 "FIRE SERVICE" response at top of hoistway, in each elevator lobby and machine room.

C. Top of hoistway smoke detector shall have 2 sets of contacts. One set, when activated shall put the elevator in phase 1 fire service and the second set shall operate the motorized louvered venting.

D. Elevator lobby smoke detectors shall activate only the elevators sharing the corresponding or common lobby.

E. Upon activation of an elevator lobby, top of hoistway or machine room smoke detection device, a signal shall be transmitted to the building fire alarm control console. The "ALARM" signal shall be transmitted from the console to the elevators which shall activate the "FIRE SERVICE PHASE 1" operation. The "ALARM" signal shall be received from any elevator lobby or machine room smoke detection device except the device located in the main lobby, shall send the elevator to a designated alternate floor. Machine room smoke detectors shall send both elevators in to Phase 1 fire service.

F. When an "ALARM" signal initiates Phase 1 operation, momentary movement of the "FIRE SERVICE" key in the lobby control panel to the "BYPASS" position shall be required to return elevators to automatic operation if "ALARM" signal is cleared.

G. Provide new fire service key switch in basement floor push button plate.

H. Basement floor is main floor, first floor is alternate floor.

2.37 MOTORIZED LOUVERED VENTING; EXISTING; GENERAL CONTRACTOR

A. General Contractor to repair and provide working top of hoistway motorized louvered venting.

B. The vent shall stay closed under power. When the top of hoistway smoke detector is activated, the power is removed from the vent and the vent shall open. When the smoke detector is reset, the vent shall close by power.

2.38 SHUNT TRIP CIRCUIT BREAKER:

A. Reuse existing mainline shunt trip circuit breakers in elevator machine room. Provide new wiring from shunt trips to new controllers.

B. Reuse existing heat detectors located in elevator machine room.

C. Provide new wiring from machine room heat detectors to fire service panel (for alarm only) and back to the machine room to a 110V (AC) switch for each circuit breaker.

D. When activated by the heat detectors, a supervised signal located in the elevator machine room in the form of a relay with a set of 110 Volt "C" contacts for each elevator is then activated. The 110 Volt circuit is to be on emergency power system. The relay shall be located in the machine room. Power shall be removed from each elevator controller by activating an independently controlled

shunt trip circuit when the temperature in the machine room exceeds the setting of the heat detector.

E. The heat detector shall be independent of the fire service system.

2.39 AUDIO VOICE SYSTEM

A. Provide voice audio activated by stopping or passing a floor. Audio voice to give floor designations. The voice announcer shall be a digitized floor announcer that will announce the floor numbers and direction of travel and special announcements. The voice announcer shall be a natural human voice that recites messages and shall comply with ADA requirements for audible car position indicators. The voice announcer shall be a full range loudspeaker to be located on top of the cab. The voice box shall be concealed above the elevator dome. The speaker shall be mounted center of the elevator dome or as directed by the COR. The voice announcer unit shall contain 21 ports which can accommodate 21 standard floors and direction messages. Install voice announcer per manufacturer's recommendations and instructions. The voice announcer shall be the product of one manufacturer of established reputation. Provide manufacturer literature and list of voice messages. Provide special messages as directed by COR.

1. Fire service message.
2. Please do not block the doors.
3. Medical emergency message.

2.40 CAR POSITION INDICATOR:

A. Provide an L.E.D. digital type of car position indicator. Locate in new main car operating panel. Remove existing car position indicator. Provide matching stainless steel to cover existing position indicator box area. L.E.D. digital readouts for floor numbers and direction arrows shall be a minimum of 2 inches high.

2.41 HALL POSITION INDICATOR:

A. Remove all existing hall position indicators and hall lanterns at all floors. Provide new L.E.D. digital type hall position indicators. L.E.D. digital readouts shall be a minimum of 2 inches high for direction arrows and floor numbers. Provide separate arrival arrows for up and down direction. Provide white for up and red for down. Provide new wiring. Install cover plate to cover all of existing hole. All hall position indicators shall be located over hoistway door.

B. Corridor position indicator shall be equipped with a clearly audible arrival gong which shall sound once for "UPWARD" bound car and twice for "DOWNWARD" bound car. Audible signal shall not sound when a car passes the floor without stopping.

2.42 COMPUTER VIDEO TERMINAL:

A. Provide one Motion Control "mView" computer system in machine room for elevators #8, #9 (Duplex).

B. The "mView" system shall provide for "trouble shooting" shutdowns and elevator problems displayed on computer screen. This shall consist of total diagnostics of operation for the elevators.

C. The computer shall also contain illuminated indicators to provide the following information.

1. The floor where each elevator is located.

2. The direction in which elevator is currently traveling or is scheduled to travel.
3. The location and direction of each currently registered hall call. These lamps shall extinguish as each call is answered.
4. Which elevator is currently out of service.
5. Which elevator is currently bypassing hall calls.
6. Which elevator is currently engaged in passenger transfers.
7. Operations program under which elevators are currently operating.

2.43 HOISTWAY ACCESS SWITCHES: NEW

A. Provide new hoistway key switches at the top and bottom floors. Top floor locate in existing hoistway access box located in door jamb. Basement floor, mount the access key switch in new box located 6 feet above the corridor floor in the wall next to the strike jamb. The hoistway key switch at the top and bottom floors shall be arranged to initiate and maintain movement of the car. When the car is being moved at the top terminal landing, the zone of travel shall be limited to a distance of approximately 10 feet down travel and a return to the top terminal. Key switch shall not be operable by any other key which may operate any other lock or device used for any other purpose in the hospital.

2.44 HOISTWAY ENTRANCES:

A. Clean and reuse existing entrance frames, sills, hanger supports, strut angles, fascia plates and dust covers.

B. Install new door tracks, new door hangers and rollers, door gibs, non vision door wings, pick up and release rollers and arms, door beaks, closers, door gibs, door fire gibs, and bumpers.

C. Provide hoistway entrance with flush two speed side slide hoistway doors. Door panels shall be not less than 16-gauge stainless steel, flush type construction, and not less than 32 mm (1 1/4 in.) thick. Wrap stainless steel around the leading and trailing edges of the door panel. Top and bottom of door panels shall have continuous stiffener channels welded in place. Reinforcement of the door panels shall be approximately 1.0 mm (0.04 in.) in thickness and of the hat section type. At bottom of each and every panel, provide two removable laminated phenolic gibs or other approved material guides and a separate fire gib. Reinforce each door panel for hangers, interlock mechanism, drive assembly, and closer. One door panel for each entrance shall bear a BOCA label, Underwriters' label, or in lieu of this, labels from other accredited test laboratories may be furnished provided they are based on fire test reports and factory inspection procedures acceptable to the COR. Fasten sight guard of 14-gauge stainless steel, extending full height of panel, to leading edge of fast speed panel of two-speed doors.

D. Reuse existing Braille plates on door entrance frames.

E. Install drop key escusion holes on all hoistway doors.

F. Replace any missing hoistway dust covers.

G. Existing entrance stainless steel frames shall be cleaned and polished.

2.45 ELECTRIC POWER DOOR OPERATORS: REMOVE EXISTING;

A. Provide a new heavy duty door operator, header, tracks, arms, etc. Door operator shall automatically open the car and hoistway doors simultaneously when the car is level and automatically close the doors simultaneously at the expiration of the open timing. Motor shall be of the high-internal resistance

type, capable of withstanding high currents resulting from stall without damage to the motor. The door operator shall be capable of opening a car door and hoistway door simultaneously at a maximum speed of not less than 2 feet per second. The closing speed shall be one foot per second. A reversal of direction of the doors from the closing to opening operation whether initiated by the infrared curtain unit, or the door open button, shall be accomplished within no more than 1-1/2 inches of door movement. Particular emphasis is to be placed on obtaining quiet interlock and door operation and smooth, fast, dynamic braking for door reversals and stopping of the doors at both extremes of travel. All levers operating the doors shall be constructed of heavy steel members and all pivot points shall have ball or roller bearings. Electric power shall be used to open and close the doors. Springs may be used for auxiliary automatic door closers required under Rule 2.11.3 of the Code.

B. Door operator shall open and close both car and hoistway door simultaneously. Inherent design and installation of door operating devices shall be such as to preclude possibility of any hoistway door panel being disengaged from operating devices under any condition of operation of cars. Doors shall open automatically when car has stopped at landing. Doors shall be synchronized with operation of leveling car and opening car and hoistway doors simultaneously. Car and hoistway doors shall close automatically after an adjustable predetermined time sufficient to allow passengers to enter and leave the car. Before the interlock circuit is established, hoistway door for landing shall lock and remain in closed position until the car makes another stop at that landing.

C. Door shall operate smoothly and without slam in opening and closing directions and shall be cushioned in final movement in each direction of travel by regulated and adjustable electric power or other equally effective means. No electrical power shall be required to hold doors either open or closed. Hoistway doors shall be provided with door closers arranged to close open doors automatically if car for any reason leaves landing zone. In case of interruption or failure of electric power, mechanism shall permit manual opening from within car at door zone only. Door operator shall operate in conjunction with, incorporate in its design, or be equipped with interlocks or safety switches. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone. Elevator, when out of the leveling zone, is restricted to 4 inch opening. Provide door locking device as per code.

D. Provide new infrared curtain unit. The device shall cause the car and hoistway doors to reverse automatically to the fully open position should the unit be actuated while the doors are closing. Curtain unit shall function at all times when the doors are not closed, irrespective of all other operating features.

E. Should the doors be prevented from closing for more than a predetermined adjustable interval of 20 to 60 seconds by operation of the curtain unit or door open button, these devices shall be rendered unable to cause door reversals, the doors shall stay open, the audio voice message shall sound and a buzzer located on the car shall sound. Do not provide door "nudging"

F. Provide car and hoistway door open and close buttons. When the door open button is pressed, the doors, if in the open position, shall remain open, or if the doors are closing, they shall stop, reverse and re-open. Momentary pressure of the door close button shall initiate the closing of the doors prior to the expiration of the normal door open time. The open and close buttons shall be located in the car operating station below the floor buttons. The door open button shall be located adjacent to the door opening.

G. Should the doors be prevented from closing by an obstruction, that does not activate a door re-opening device, for more than an adjustable interval of 15 to 60 seconds, the doors shall automatically reverse to the fully opened position.

H. Provide new door clutch, gate switch, door header, track, arms and related door equipment.

2.46 ELECTRIC INTERLOCKS:

A. Replace each hoistway door interlock with new interlock functioning as a hoistway unit system, to prevent operation of car until all hoistway doors are locked in closed position as defines by code. Interlocks shall prevent opening of hoistway doors from corridor side, unless car is at rest at landing, is operating in leveling zone at landing or hoistway access is used.

B. Hoistway interlocks shall not be accepted unless it has successfully met requirements of Rule 2.12.6 of Code. Retiring cams or other approved devices shall be securely fastened to the car and shall be arranged to operate the interlocks without objectionable noise, shock or jar.

C. Wiring installed from the hoistway riser to each door interlock shall be NEC type SF-2 or equal.

D. Equip car doors with electric contact which prevents operation of car until door is closed as defined in the Code, unless car is operating in leveling zone or hoistway access is used. Locate door contact to prevent its being tampered with from inside the car. Car door contact shall not be accepted unless it has successfully met requirements of Rule 2.12.6 of the Code.

E. Provide devices, either mechanical or electrical, which shall prevent operation of the elevator in the event of an accident to or defective door operator equipment has permitted an independent door panel to remain in the "UNCLOSED" or "UNLOCKED" position.

2.47 CAR SLING: REUSE EXISTING CAR SLINGS

A. Present car frame shall be checked for proper alignment and correct if necessary. All bolt connections shall be checked, tightened or replaced, where necessary.

B. Reuse existing Safety Operating Switch (SOS).

2.48 CAR ENCLOSURE FOR ELEVATORS

A. Reuse existing cab. Clean and polish all stainless steel including front return panels and car door jambs.

B. Reuse existing bottom half of cab existing stainless steel sheet covering. Provide new side and rear walls. New panels from top of stainless steel up to ceiling shall be covered with high pressure plastic laminate. Apply the plastic laminate to a minimum thickness of ½ inch fired rated particle board. Submit a method of fastening particle board to steel wall. The particle board shall one piece on back and side walls. Color to be selected by COR.

1. All joints shall be smooth and flush, with no ragged or broken edges.

C. Remove existing cove lighting. Re-skin cab ceiling with sheet steel and repaint dome bright white. Allow for fan and emergency exit. Provide aluminum hanging ceiling frame. Construct frame of 1/8 in. x 1 1/2 in. x 1 1/2 in. "T" and "L" sections, divide ceiling into six panels. Install new drop ceiling with flat plastic laminate and egg crate type panels in new aluminum frame. Type panel, frame, and color to be selected by COR.

- D. Install 4 sets of LED frosted T-8 fluorescent light tubes 4 ft long with new ballasts.
- E. Remove existing cab handrails. Install 2 new sets of stainless steel handrails on side and rear walls with a centerline of 30 inches and 42 inches. Hand rails to be 3 inches wide by $\frac{1}{4}$ inch thick flat stock. Locate handrails approximately $1\frac{1}{2}$ inches from walls. Curve ends of handrails to wall. Conceal all handrails fastenings. Handrails shall be removable from inside the car enclosure.
- F. Provide a stainless steel capacity plate in each elevator car. Capacity plate shall be conspicuously located on the front return panel containing the car operating panel. Plate shall show the rated capacity of the elevator in pounds with engraved or cast letters not less than 1/4-inch high. Engraved letters shall be filled with black paint. The capacity may be engraved in the main car operating panel faceplate in lieu of a separate capacity plate
- G. New emergency car lighting system. Install in new main car operating panel. Remove existing emergency light from cab.
- H. Provide a new blower unit arranged to exhaust through an opening in the canopy. Provide a stainless or chrome plated fan grill around the opening. Provide 2-speed fan, capable of rated free delivery air displacement of approximately 380 and 700 cfm at respective speeds. Mount fan on top of car with rubber isolation to prevent transmission of vibration to car structure. Provide screening over intake and exhaust end of blower. Provide a 3-position switch to control the unit in the service panel.
- I. Removed existing car directional running lights located in car door jamb. Cover hole with stainless steel plate.
- J. Remove existing electrical outlet in cab located below main car operating panel. Install new GFI electrical outlets with stainless steel faceplates where existing outlets are now located.
- K. Reuse existing emergency exit electrical contact switch to prevent operation of elevator when emergency exit is open.
- L. Provide elevators with new side opening horizontal sliding car doors. Construst door panels to be flush hollow metal construction, not less than one inch thick, consisting of not less than one piece continuous, 16 gauge stainless steel on car face side and leading and trailing edges. Separate by two plates of sound deadening material, and reinforce by steel shapes welded to the plates at frequent intervals. Reinforce panels as required for installation of hanger, power operating and door opening devices. Hang doors on two point suspension hangers having ball bearing sheaves not less than 3 inches in diameter, with rubber or non-metallic sound reducing tires. Equip hangers with adjustable ball bearing rollers to take up thrust of panels. Up thrust roller shall be capable of being locked in position after adjustments to a maximum of 0.015 inch clearance. Provide two non-metallic gibs on each door panel. Gibs shall be replaceable without removal of door panel.
- M. Install handrails on top of car for safety. Provide as per National Elevator Code A17.1.

2.49 INTERCOM AUTO DIAL SYSTEM

- A. Remove existing auto dial phone system. New auto dial system shall be provided for each elevator to replace existing auto dial system. Each auto dial shall have a separate number. Locate auto dial system in the auxiliary car operating panel. The speaker and unit shall be mounted on the backside of the

perforated stainless steel plate cover. When activated by the "PUSH TO TALK" button, the auto dial shall automatically dial to the operator. If the operator ends the call, the phone shall be able to redial immediately.

PART 3 - EXECUTION

3.1 SPACE CONDITIONS

A. Attention is called to existing overhead clearances, pit clearances, overall spaces available in hoistway and machine room and machine room environmental conditions in connection with completion of specified elevator work. Provide proper, satisfactory and code legal installation of equipment as a whole, including all construction, accessories, and devices in connection with elevator, mechanical and electrical work specified herein.

B. Any construction changes or relocation of equipment, conduit, wiring, etc., required to accomplish the specified elevator installation must be arranged and obtained by the contractor, subject to the approval of the Contracting officer. Cost of such changes shall be included in the base bid and shall form a part of the contract.

3.2 ARRANGEMENT OF EQUIPMENT:

A. Clearance around new elevator, mechanical and electrical equipment shall comply with applicable provisions of NEC. Arrange new equipment so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same area.

3.3 WORKMANSHIP AND PROTECTION

A. All installations shall be made in a first class, neat and skillful manner by mechanics experienced in the trade involved. All details of the installation shall be mechanically and electrically correct. All materials and equipment shall be new and without imperfections.

B. Recesses, cutouts, slots, holes, patching, grouting, refinishing and the like to accommodate installation of equipment shall be included in the contractor's work. All new holes in concrete shall be core drilled.

C. No structural members shall be cut or altered. Work in place which is damaged or defaced shall be restored equal to original condition.

D. Finished work shall be straight, level and plumb, with true, sharp surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.

E. Sleeves for all conduit and other small holes shall project two inches above concrete slabs.

F. Where beams, slabs, or other building construction protrude more than four (4) inches into the hoistway, all top surfaces shall be leveled with 20 gauge steel at an angle of at least 75 degrees to the horizontal.

G. Contractor shall provide and maintain adequate fire extinguishers on site and in the areas where welding or cutting is to occur.

H. Provide screening between hoistways during construction.

3.4 PRETESTS AND TESTS: Pretest, as per specifications, the elevators and related equipment, in the presence of the COR for proper operation before requesting final inspection.

A. Procedure outlined in the "Practice for Inspection of Elevators, Escalators and Moving Walks (Inspectors Manual)' ANSI A17.2 shall apply.

1. Final test shall be conducted in the presence of and witnessed by the Veterans Administration Consulting Support Office (00C3C), Elevator Engineers or a "THIRD PARTY" ASME QEI-1 Certified Elevator Inspector.
2. Government shall furnish electric power including necessary current for starting, testing and operating machinery of each elevator.

B. If required by the Veterans Administration elevator engineer, inspection shall be conducted at other than normal working hours.

1. Contractor shall furnish the following test instruments and materials on-site and at the designate time of inspection: properly marked testing weights, voltmeter, center reading ammeter, thermometers, stopwatch, direct reading tachometer and a series of "walkie-talkies".
2. If during the inspection process, the Department of Veterans Affairs representatives determine the need, the following instruments should be available within a four-hour period: megohm meter, vibration meter, sound meter and a light meter.

C. Inspection shall be made of workmanship and equipment furnished and installed for compliance with specification.

D. Balance Tests: The percent of counterbalance shall be checked by placing test weights in car until the car and counterweight are equal in weight when located at the mid-point of travel. If the actual percent of counterbalance does not conform to the specification (40%), the amount of counterweight shall be adjusted until conformance is reached.

E. Full Load Run Test: Elevators shall be tested for a period of one hour continuous run with full contract load in the car. During the test ran, the car shall be stopped at all floors in both directions of travel for a standing period of not less than five nor more than 10 seconds per floor.

F. Speed Test: The actual speed of the elevator shall be determined in both directions of travel with full contract load and no load in the elevator. Speed tests shall be made before the full load run test and after the full load run test. Speed shall be determined by applying a tachometer to the car hoisting ropes and/or governor rope. The actual measured speed of the elevator with all loads in either direction shall be within five percent of specified rated speed.

1. Full speed runs shall be quiet and free from vibration and sway. When cars are standing at the floor with doors open, they shall remain fully stopped with hoisting machine brake applied.

G. Temperature Rise Test: The temperature rise of the hoisting motor shall be determined during the full load test run. Temperatures shall be measured by the use of thermometers inserted into the various windings. Under these conditions, the temperature rise of the equipment shall not exceed 50 degrees Centigrade above ambient temperature. Test shall be started only when all parts of equipment are within five degrees Centigrade of the ambient temperature at time of starting test. Other tests for heat runs on motors shall be as specified in the latest procedure of the Institute of Electrical and Electronic Engineers.

H. Check amp readings with empty, balanced, and full load. At full load, the amp readings shall not exceed the motor nameplate amperage.

I. Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car, balanced load in car and with contract load in car, in both directions of travel. Accuracy of floor leveling shall be within plus or minus 1/8 inch of level with any landing floor for which the stop has been initiated (with a definite range of distance in advance of the landing) regardless of load in car or direction of travel. The car leveling device shall automatically correct over travel as well as under travel and shall maintain the car floor within plus or minus 1/8 inch or level with the landing floor regardless of change in load.

J. Brake Test: The action of the brake shall be prompt and a smooth stop shall result in down direction with no load up to and including 125 percent of contract load in the car. Up travel not required.

K. Insulation Resistance Test: The elevator's complete wiring system shall be free from short circuits and grounds and the insulation resistance of the system shall be determined by use of MEGGER, at the discretion of the Veterans Administration representative conducting the test.

L. Safety Devices and Governor Tests: The safety devices and governor shall be tested as required by Rule 8.10.2 of the Code.

M. If equipment fails, test requirements and re-inspection is required. The Contractor shall be responsible for costs of re-inspection, including salaries, transportation expenses and other expenses of the representatives of the COR.

N. Limit Stops:

1. The position of the car when stopped by each of the normal limit stops with contract load in the car shall be accurately measured. The car shall reach the terminal landings under the above condition.
2. Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with contract load in the elevator. Elevator shall be operated at contract speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

O. Oil Buffer Tests: These tests shall be conducted with operating device and limit stops inoperative and with contract load in the elevator for the car buffer and with no load in the elevator for the counterweight buffer. Preliminary test shall be made at the lowest (leveling) speed. Actual tests shall be conducted at contract speed. Buffers shall compress and return to the fully extended position without oil leakage.

P. Setting of Car Door Contacts: The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by the Code. The test shall be made with the hoistway doors closed or the hoistway door contact inoperative.

Q. Setting of Interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed the Code Requirements.

R. Operating and Signal System: The elevator shall be operated by the operating devices provided and the operation signals and automatic floor leveling shall function in accordance with requirements specified. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration or deceleration. Stopping shall be without bumps or jars.

S. Performance of the elevator dispatching system shall be witnessed and approved by the COR's representative.

3.5 PAINTING AND FINISHING

A. Controllers and all other uncoated ferrous metal items shall be painted not less than one factory priming coat or approved equal.

B. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleaned of grease, oil, cement, plaster and other debris. All equipment, except that otherwise specified as to architectural finish, shall then be given two coats of paint of approved color, conforming to manufacturer's standard.

C. No field painting of governors shall be permitted.

D. Paint floor designation not less than four inches high on hoistway doors, fascias and/or walls as required by Rule 2.29.2 of the Code. The color of paint used shall contrast with the color of the surfaces to which it is applied.

E. Elevator hoistway machines, controllers and selectors shall be identified by 4-inch high numbers located as directed. Governors, shunt trip circuit breakers, safety plank and cross heads of cars shall be identified by 4-inch high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled.

F. Surface of door frames, door panels, interior cab surfaces, etc., that become damaged or marred during renovations shall be restored to original condition in a satisfactory manner before final acceptance of work.

3.6 INSTRUCTION OF PERSONNEL

A. Provide competent instructors to train VA personnel in operation of the equipment and accessories installed under this contract, for a period of not less than one eight hour work day. Instruction shall commence after completion of all work and at such time as directed by the COR. Training shall be conducted during the hours of 8:00 AM through 4:30 PM.

B. In addition to oral instruction, written instructions in triplicate relative to car, adjustment and operation of all equipment and accessories shall be furnished and delivered to the COTR in independently bound folders. Written instructions shall include correct and legible wiring diagrams, nomenclature sheet of all electric apparatus including location of each device, complete and comprehensive sequence of operation, complete replacement parts lists with descriptive literature and identification and diagrammatic cuts of equipment and parts.

C. Provide any supplementary instruction for adjustment and care of new equipment that may become necessary because of changes, modification and/or replacement of equipment or operation under requirements of paragraph entitled "GUARANTEE".

D. Provide to the project engineer a complete parts list for controllers, leveling units, door operator, door hanger units, hall position indicators and push buttons, car operating panels, etc.

3.7 INSPECTIONS AND MAINTENANCE SERVICE

A. Furnish complete maintenance and inspection service on entire elevator systems. The modernized elevator systems shall be guaranteed for a period of one year beginning with the completion and acceptance of the last elevator installation by COR. Maintenance work shall be performed by Certified Elevator

Mechanics and Apprentices employed supervised by the company that is providing guaranteed period of service on the elevator equipment specified herein.

B. This contract will cover full maintenance, which includes emergency call back service, inspections and preventive maintenance of each of the elevators listed in the Schedule of Elevator. The Contractor shall be required to perform WEEKLY inspections during the one year maintenance period. During the inspection visit, the Contractor shall clean, adjust and lubricate the equipment. Determine the nature and extent of any trouble required to restore the elevators to satisfactory service, and if conditions warrant, furnish and install parts.

C. When and as required, motors, controllers, relay panels, selectors, leveling devices, operating devices, switches, in car and in hoistways, hoistway door and car door or gate operating device, interlock-contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, signal system, car safety device, governors, tension and sheaves in pit shall be cleaned, lubricated and adjusted. Hoist motor brushes shall be checked for wear at least every two weeks. Accumulated carbon shall be removed from the commutators, brush rigs and windings at the same time.

D. Furnish all lubricant, cleaning materials and parts required.

E. Cleaning Services: Guide rails, overhead sheaves and beams, counterweight frames, bottom of platforms and machine rooms floors shall be brushed cleaned at least once every four month. Car tops shall be cleaned monthly. All accumulated rubbish shall be removed from the pits monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Necessary cleaning supplies, vacuum cleaner, shall be furnished by the Contractor.

F. Adjustment Services: All hoistway ropes shall be examined and the tension shall be adjusted whenever necessary to insure maintenance of adequate safety factors.

G. Materials To Be Furnished: The Contractor shall furnish all lubricants, cleaning supplies and tools necessary to perform the work described above. All lubricants shall be as recommended by the manufacturer of the equipment.

H. This guarantee service shall not include the performance of any work required as a result of improper use, accidents, or negligence for which the contractor is not directly responsible.

I. Provide 24 hour emergency call-back service which shall consist of promptly responding to calls within two hours for emergency service should a shutdown or emergency trouble develop between regular examinations and one hour for "Trap Call". Overtime emergency call-back service shall be limited to minor adjustments and repairs required to protect the immediate safety of the equipment and persons in and about the elevator.

J. Service and emergency personnel shall report to the COR or his authorized representative upon arrival at the medical center and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the COR.

K. The contractor shall maintain a log in the Elevator Machine Room. The log shall list the date and time of all weekly examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary correction performed or parts replaced.

L. When arriving on site to start the elevator renovation, the Elevator contractor shall start to maintain all elevators in this contract during renovation period. This will be a no billable cost to the VAMC. This maintenance

period shall be included in the renovation bid. This is separate from the one year maintenance contract which starts with the completion of project.

END SECTION 14 26 26